

REMARKS

This is a full and timely response to the outstanding Final Office Action mailed July 3, 2003. Applicant encloses a Petition for a One Month Extension of Time and check in the amount of \$55 for the associated fee. In the event an additional Petition for an Extension of Time is required, this paper is to be considered as such a Petition. Reconsideration and allowance of the application and presently pending claims, as amended, are respectfully requested.

1. Amendments to the Claims

By the present response, Applicant amends claim 1. Claim 1 is amended to clarify that the recited tacky film promotes solder interconnects without intervening WLCFU material, and that the tacky film and the WLCFU material are not the same. Support for this amendment is found throughout the specification as originally filed, for example, page 2, lines 20-25; page 3, lines 19-28; and the Examples. No new matter is believed to be introduced by these amendments. Applicant submits that the amendments do not introduce new issues for consideration and will not necessitate any additional searching. Additionally, Applicant submits that the amendments be entered because they place the application in condition for allowance or reduce the issues for appeal.

2. Rejection of Claims 1-12 and 13-28 Under 35 U.S.C. § 103(a)

Claims 1-12 and 15-28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilleo et al. (U.S. Patent 6,194,788) in view of Lin et al. (U.S. Patent 6,207,475). Applicant traverses this rejection because the combination of the cited references does not teach or suggest the claimed subject matter as discussed below.

A. Relevant Law

The United States Patent and Trademark Office (USPTO) has the burden of showing a prima facie case of obviousness. In re Bell, 991 F.2d 781, 783 (Fed. Cir. 1993). In determining obviousness, the invention must be considered as a whole, and the

claims must be considered in their entirety. Medtronic, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1567 (Fed. Cir. 1983). A prima facie case of obviousness is established when the teachings from the prior art itself would have suggested the claimed subject matter to a person of ordinary skill in the art. In re Rhinehart, 531 F.2d 1048, 1051 (CCPA 1976). More specifically, the requirements for establishing a prima facie case of obviousness include: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

When a rejection depends on a combination of prior art references, the USPTO must show that there is some teaching, suggestion, or motivation to combine the references. In re Geiger, 815 F.2d 686, 688 (Fed. Cir. 1987). The mere fact that the prior art could be modified would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 733 F.2d 900, 902 (Fed. Cir. 1984). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991). Finally, obviousness may not be established using hindsight. W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983).

B. Analysis

Applicant has amended independent claim 1 to indicate that the applied tacky film is not the same material as the underfill and that the tacky film promotes solder interconnects without intervening WLCFU material. Applicant respectfully submits that none of the cited references, either alone or in combination, teach or suggest the subject matter as presently claimed.

The final Office Action maintains the obviousness rejection of claims 1-12 and 15-28 over Gilleo et al. and Lin et al. because Gilleo et al. allegedly teaches or suggests all of the claim limitations, either expressly or inherently. Lin et al. is cited as expressly

teaching that the underfill can be cured simultaneously with solder reflow. Even so, the combination of the references fails to teach or suggest an underfilling process that applies an underfill and covers exposed solder bumps with a tacky film wherein the tacky film and the underflow material are not the same. More specifically, the combination of Gilleo et al. and Lin et al. does not teach or suggest: applying a WLCFU material onto the surface of a bumped wafer and covering exposed solder bumps with a tacky film for promoting solder interconnects without intervening WLCFU material, wherein the tacky film and the WLCFU are not the same.

The final Office Action alleges that Gilleo et al. teaches underfill material that is applied both below the solder bumps and above the solder bumps, and that the portion of the underfill covering the solder bumps is equivalent to the claimed tacky film. Applicant respectfully disagrees.

The claimed process recites, among other things, covering exposed solder bumps with a tacky film for promoting solder interconnects without intervening WLCFU material, wherein the tacky film material and the underfill material are not the same. In one embodiment, the tacky film promotes solder interconnects without intervening underflow material by preventing underflow material from covering the solder interconnects during solder reflow. Thus, the claimed process applies two different compositions for different purposes, namely an underfill for support, and a tacky film for promoting solder interconnects without intervening underfill.

Gilleo et al. does not teach or suggest applying two different compositions to a wafer to promote solder interconnects without intervening underfill material. Indeed, Gilleo et al. does not teach or suggest using anything to cover exposed solder bumps for promoting solder interconnects without intervening underfill. Gilleo et al. teaches that underfill preferably covers the solder bumps to protect them from oxidation, contamination, and mechanical damage (col. 5, lines 61-67). Thus, the teachings of Gilleo et al. are in direct opposition to the claimed subject matter.

Moreover, the underfill taught by Gilleo et al. cannot be the equivalent of the claimed tacky film because the claimed tacky film is a different material than the underfill and prevents underfill from intervening between solder interconnects during solder reflow. One of the objects of the present invention is to prevent underfill from

coming between solder interconnects. Nothing in Gilleo et al. teaches using a separate and different tacky film composition to promote solder bump interconnects without intervening underfill. The final Office Action provides, "Because in Gilleo, the underfill portion and the tacky portions are from the same material, when cured the two portions are cured simultaneously" (emphasis added).

Nothing in Lin et al. cures the deficiencies in the teachings of Gilleo et al. As a result, the combination of Gilleo et al. with Lin et al. fails to teach or suggest all of the elements of the claims, and the rejection of the claims as obvious in view of the combination cannot stand.

3. Rejection of Claims 13 and 14 Under 35 U.S.C. § 103(a)

Claims 13 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gilleo et al. (U.S. Patent 6,194,788) in view of Lin et al. (U.S. Patent 6,207,475) and further in view of Yonemoto (JP Patent 61-138614). Applicant respectfully traverses this rejection because the combination of references does not teach or suggest all of the claim elements.

Applicant notes that claims 13 and 14 are ultimately dependent on claim 1. Accordingly, claims 13 and 14 incorporate all the limitations of claim 1, and are not obvious over the cited references at least for the reasons claim 1 is not obvious over the cited references. Accordingly, Applicant respectfully submits the rejection is overcome.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all rejections have been traversed and/or accommodated, and that the now pending claims 1-28 now under consideration are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.


Respectfully submitted,



Charles Vorndran, Ph.D.
Registration No.: 45,315

THOMAS, KAYDEN,
HORSTEMEYER & RISLEY, L.L.P.
Suite 1750
100 Galleria Parkway N.W.
Atlanta, Georgia 30339
(770) 933-9500

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Signature – Jennifer Pomonis